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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,101	11/02/2000	V.M. Segal	30-5076(4015)	4990

7590 09/12/2002

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EXAMINER

WESSMAN, ANDREW E

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/705,101		SEGAL ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Andrew E Wessman		1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 July 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13, 67-80, 82 and 83 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 67-80, 82 and 83 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. Claims 1-13 and 67-80 remain for examination. Claims 14-66 and 81 have been cancelled. Claims 14-66 are cancelled as being drawn to a non-elected invention, and this cancellation was confirmed by a phone call to Jennifer Taylor on September 9, 2002 in order to clarify applicant's request in the amendment dated July 19, 2002. New claims 82 and 83 have been added.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 11, 12, and 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant has failed to correct the language of claims 11, 12, and 68 to clearly recite what is considered the invention. The phrase "comprising one or more of" is open language, and such language leaves open the possibility for other elements to be present that are not in the recited list. Because there is no limitation placed on what elements may be present, literally any mixture of elements may be present in the physical vapor deposition target. Furthermore, while applicant's list is composed of elements, the open language does not preclude the addition of any other substance, including compounds. Because applicant's invention is not applicable to all matter in existence, it is necessary to use language in which the metes and bounds of the invention are clearly set forth with regards to the elements and compounds usable in the

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invention. The examiner suggested using Markush language, to which the applicant replied that according to MPEP 2173.05(h), Markush language is only one acceptable form of alternative expression. While the examiner acknowledges that applicant has the right to compose the claims as he or she sees fit, the claims must be written in such a way that the subject matter which applicant considers the invention must be clearly set forth. Because no limits have been placed upon the composition of the physical vapor deposition target in claims 11, 12, and 68, clarification of the claims must be made in whatever manner applicant desires, so long as what applicant considers to be the invention is clearly stated.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7-13, 67-69, 71-74, and 77-80 are rejected under 35 U.S.C. 102(b) as being anticipated by Dunlop et al.

Dunlop et al. is applied to the claims for the reasons set forth in paper No. 4, paragraph 9.

With regards to the amended features of claim 1, wherein the material is formed by casting, Dunlop et al. discloses (col. 5, lines 6-8) that the process of making the sputtering targets may involve casting. Dunlop et al. also discloses (col. 9, lines 7-9) that while liquid dynamic compaction is the method most discussed in the disclosure, it

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is not critical to the practice of forming ultra-fine grain sputtering targets to use the method, and that equal channel angular extrusion will produce such sputtering targets both by itself and in conjunction with LDC.

With regards to the amended feature of claim 67, wherein the precipitates have a maximum dimension of 0.5 microns, Dunlop et al. discloses (see claim 12) that the sputtering target precipitates should be less than 1.0 microns in size, which encompasses the scope of the invention as claimed.

6. Claim 83 is rejected under 35 U.S.C. 102(b) as being anticipated by Dunlop et al.

Dunlop et al. discloses a sputtering target having (see claim 1) grain sizes of less than 30 microns, and precipitate dimensions (see claim 12) of less than 1 micron, which encompasses applicant's claimed less than 0.5 microns. Dunlop et al. also discloses (see claim 14) that such sputtering targets may have predominately <220> texture.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5, 6, 75, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al.

Dunlop et al. is applied to the claims for the reasons set forth in paper No. 4, paragraph 11.

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9. Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Segal.

Dunlop et al. in view of Segal is applied to the claims for the reasons set forth in paper No. 4, paragraph 12.

10. Claim 82 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al.

Dunlop et al. teaches (see claim 7) a sputtering target wherein all the grains have a grain size of less than 2 microns, which encompasses the scope of the claimed invention.

Dunlop et al. does not specifically teach ratios of <220> crystallographic orientations relative to those of other orientations. However, Dunlop et al. does teach that strong <220> crystallographic textures are associated with high quality conical aluminum sputtering targets (col. 8, lines 63-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a sputtering target with the highest ratio of <220> crystallographic texture possible in order that the sputtering target provide the best sputtered film uniformity possible, as taught by Dunlop et al. (col. 8, lines 64-65).

### ***Response to Arguments***

11. Applicant's arguments filed July 19, 2002 have been fully considered but they are not persuasive. In the remarks, applicant argues:

(1) Dunlop et al. does not disclose using a material formed by casting.

- (2) Dunlop et al.'s disclosure of a precipitate size of less than 1 micron does not anticipate the claimed invention's limitation of less than 0.5 microns; and
- (3) Dunlop et al. does not specifically teach a ratio of <220> textures of the amounts claimed by the applicant.

In regards to applicant's argument (1), Dunlop et al. does disclose, in col. 5, lines 6-8, that the material used may be originally from a cast material. Dunlop et al. also discloses that the invention does not necessarily require the use of LDC and ECAE in conjunction, but that one or the other may produce the expected results. Therefore, Dunlop et al. may reasonably be expected to be practiced upon a cast material.

In regards to applicant's argument (2), Dunlop et al. does not specifically teach the precipitates having dimensions of 0.5 microns or less, but instead teaches more broadly that the materials have precipitate dimensions of 1 micron or less. This disclosure encompasses applicant's claimed range. Applicant has contended that this range is not anticipated because where a narrow range is present, the broad range does not always anticipate the narrow range. However, in order to show that the narrow range of applicant's claims is patentably distinct from the Dunlop et al. broad range, a showing of the criticality of the range must be made. Applicant should provide comparative data for precipitate sizes of 1 micron and 0.5 microns in order to show that reducing the size of the precipitates from 1 micron to 0.5 microns produces some distinct advantage. Absent this showing, the narrow range of applicant's invention is fully half of the broad range, and as such is not sufficiently narrow to be patentably distinct without some showing of the criticality of the narrow range, as there is no reason

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to believe at the moment that the reduction of precipitate sizes from 1 micron to 0.5 microns would produce some unexpected result.

In regards to applicant's argument (3), while Dunlop et al. does not provide a specific citing of a texture ratio for <220> crystallographic texture of 80% or 90%, Dunlop et al. does provide motivation (col. 8, lines 63-65) for creating a sputtering target with as high a ratio of <220> crystallographic texture as possible. Because the motivation to make the ratio as high as possible is there, it would have been within expected abilities of one of ordinary skill in the art to make a sputtering target with at least 80% or 90% of <220> crystallographic texture in order to obtain targets with good sputtering uniformity. Applicant is invited to provide evidence that the method of Dunlop et al. is incapable of creating a target with such texture in order to rebut the examiner's assertion.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew E Wessman whose telephone number is (703)305-3163. The examiner can normally be reached on Monday through Friday, 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703)308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

AEW  
September 9, 2002

ROY KING   
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700